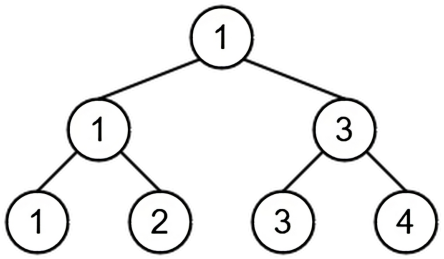
Segment Tree

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

Lisa loves segment trees very much. Today, she found an array of distinct natural numbers of length 2^k at home and immediately built a segment tree with the minimum operation.

A segment tree with the minimum operation is a binary tree where each node has a left and right child. The leaves of the tree, when considered from left to right, contain the elements of the original array. The values of other nodes are calculated as the minimum value of their children's values.

For example, if the original array is $[1, 2, 3, 4]$, then the segment tree with the minimum operation will look like:



Lisa asked her friend Masha to draw the constructed tree on a piece of paper, and Masha did it. The next day, Lisa tried to remember what the original array looked like, but when she found the piece of paper, she was surprised to discover that Masha simply wrote the values in the nodes of the tree in a random order.

Help Lisa restore the original array or determine that Masha incorrectly wrote the values.

Input

The first line contains a single number n — the number of elements of the segment tree written on the piece of paper ($1 \le n \le 2 \cdot 10^5$). It is guaranteed that there exists an integer k such that $n = 2^{k+1} - 1$.

The second line contains n numbers $a_1, a_2, \ldots a_n$ — the elements of the segment tree written on the piece of paper ($1 \le a_i \le 10^9$).

Output

Print -1 if it is impossible to restore the segment tree with the minimum operation from the numbers written on the piece of paper, which was built from an array of distinct natural numbers. Otherwise, print the original array. If there are multiple solutions, any of them can be printed.

Examples

standard input	standard output
7 2 3 1 1 4 1 3	1 2 3 4
3 1 2 3	-1
3 1 1 1	-1

Note

In the third test example from the set of numbers, it is possible to build a segment tree with the minimum operation. However, in the original array, the numbers will not be distinct in this case.